Acknowledgement

The complexity of nature makes the understanding of any of its aspects impossible unless the researcher is assisted by collaborators, benefactors and well-wishers.

During the course of my doctoral research, I have been the fortunate beneficiary of assistance, of varied kinds, from many. It is my pleasant duty to hereby express my sincere gratitude.

At the outset, I acknowledge that the Almighty has been the source of inspiration all through my life and, also, in my pursuit of research.

My Research Guide, Prof. J.A.E. Desa, deserves my utmost gratitude for multiple reasons: *inter alia*, guidance in the choice of topic, words of encouragement, insightful advice and assistance in surmounting the inevitable research-related difficulties that cropped up from time to time. All these, despite his numerous responsibilities (as Dean of the Faculty of Natural Sciences and Head of the Department of Physics) and meetings (which often seemed interminable, both, in abundance and duration).

I sincerely thank University Grants Commission for the award of Teacher Fellowship under its Faculty Improvement Programme (XI Plan) but for which it would have been almost impossible, for me, to devote my time and energy towards research.
I shall remain eternally grateful to my Principal, Rev. Dr. Walter de Sá for his care, concern and encouragement during my doctoral research. Besides, the award of the Teacher Fellowship was entirely due to his prompt processing and diligent follow-up of the requisite paperwork.

In the same breath, I express my gratitude to the Diocesan Society of Education for sanctioning Leave thereby enabling me to take up the Teacher Fellowship.

Most of my experimental work was performed at Bhabha Atomic Research Centre, Bombay. The access to the neutron, and other, facilities was made possible under the aegis of Collaborative Research Project CRS-M-149 awarded by University Grants Commission-Department of Atomic Energy-Consortium for Scientific Research (UGC-DAE-CSR), Mumbai Centre. I am sincerely thankful to UGC-DAE-CSR, its Director, Dr. Pravin Chadda, and the Mumbai Centre Director, Dr. Vasudev Siruguri for their support and encouragement.

My experimental measurements became a reality through the untiring efforts of many a collaborator at B.A.R.C., Mumbai viz. Dr. Vinod K. Aswal (SANS), Dr. D. Sen (USANS), Dr. P.S.R. Krishna and Mr. A.B. Shinde (High-Q Neutron Diffraction), and at N.C.L., Pune: Dr. Manohar V. Badiger (the initial introduction to the world of polymers and gels, and, later, rheology measurements). While thanking each of them from the depths of my heart, I wish to hereby express my gratitude in a very special manner to Dr. Vinod K. Aswal (our Principal Collaborator and Contact Scientist under CRS-M-149) for making each visit to Bhabha Atomic Research Centre comfortable, enriching, memorable and
successful. Besides, his eye for detail and immense experience stood me in good
stead in the numerical analysis and interpretation of the data.

I would like to thank my Subject Experts viz. Prof. P.R. Sarode and Dr. K. Priolkar
for their advice and constructive suggestions which proved highly valuable in my
work. The co-operation and assistance received from the faculty of Department of
Physics, Goa University and from Prof. S.P. Kamat (Department of Chemistry) are
also gratefully acknowledged.

Doctoral research, like life, has its ups and downs. One needs consolation, advice
and encouragement so as to successfully navigate the perilous waters and reach the
shore of success. My close friend, Rev. Dr. Simão Remedios Diniz (presently,
Principal of Rosary College of Commerce and Arts, Navelim-Goa) played an
admirable role, as always, in this regard. His wise counsel and prayers have
enabled me to complete the arduous journey.

The generous help and co-operation of my fellow Research Scholars viz. Wilson
Vaz, Dr. G. Kundaikar, Nelson Lobo, Shraddha Ganorkar, Kapil Ingle, Elaine
Dias, Neelima B, Manoj Kothawale, Jaison Joseph, Pranav Naik and Reshma Raut
Dessai will always remain green in my memory.

The co-operation received from the non-teaching staff of Department of Physics,
Goa University viz. Ramchandra Naik, Hermina Araujo, Eva Baptista and Santosh
Vaingankar is gratefully acknowledged.
My sincere thanks to Mr. Thomas Alvares for his moral support during the entire course of my work. Besides, through hours of patient labour, he has used his DTP expertise to ensure that my Thesis has attained its present form.

Finally, I cannot fail to mention my parents and brother who, as always, have displayed great care and concern during my doctoral research. They have put up with my odd timings and periods of absence, with no word of complaint. I have been shielded, through their efforts, from activities which could have proved distracting and de-focussing. Indeed, I am unable to find appropriate words to express my heart-felt sentiments of gratitude.

I willingly concede that assistance has also been received from many other quarters not listed herein. The non-appearance of an explicit mention is purely unintentional.

In conclusion, to each and everyone, Gratias tibi ago.

Mathias Bosco Lawrence